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EFFECTS OF THE TEMPORARY EMERGENCY FOOD  
ASSISTANCE PROGRAM ON DISPLACEMENT  
OF COMMERCIAL SALES -  
1989 REPORT TO CONGRESS

United States Department of Agriculture

November 1989



United States  
Department of  
Agriculture



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## OVERVIEW

The Secretary of the United States Department of Agriculture (USDA) is required to report annually to Congress on the occurrence and extent of displacement of commercial market sales due to commodity donations through the Temporary Emergency Food Assistance Program (TEFAP).<sup>1</sup> An examination of the effects of TEFAP commodity donations on commercial markets is required to ensure that such donations do not conflict with USDA's price support and agriculture stabilization responsibilities.

The term displacement, as used in this and previous reports, refers to the reduction in the normal sale of a product to households due to the receipt of donations of a like or substitute product. As defined, displacement is not a function of total market trends, but of individual household behavior. Displacement can technically occur even if a product's market is expanding.

Because the volume of butter and, until recently, process cheese donated through TEFAP is large relative to the size of comparable commercial markets, displacement is a particular concern for the program. In 1988, 176 million pounds of process cheese and 67 million pounds of butter valued at \$88 million and \$93 million, respectively, were donated through the program. Process cheese donations represented about 7 percent of the domestic commercial American cheese market. Butter donations represented about 7 percent of the domestic commercial butter market and less than 3 percent of the domestic commercial margarine market.

Although other types of commodities (i.e., flour, cornmeal, honey) are distributed through TEFAP, their donation levels relative to commercial market size are not large enough to permit valid estimates of displacement. No significant effects on commercial markets are expected.

This fourth annual report updates estimates of the displacement of commercial margarine and process cheese sales attributable to donations of cheese and butter through TEFAP. The updated econometric model of factors affecting annual commercial disappearance indicates a pound-for-pound displacement of margarine sales due to butter donations. This finding is consistent with that reported previously. The model indicates a lower displacement rate for commercial cheese sales, although the lowered estimate is not statistically different from previous estimates.

Distributions of process cheese ceased in mid-1988 after surplus inventories available to TEFAP were depleted. There is no

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<sup>1</sup>. Food Security Act of 1985 (P.L. 99-198)





evident displacement of commercial butter sales attributable to TEFAP donations. Low-income households are more inclined to purchase margarine, a less expensive substitute product, instead of butter.

The report was prepared by the Food and Nutrition Service in cooperation with the Economic Research Service. In the following sections, previous estimates are reviewed, the data sets and methodology used to estimate displacement are described and the cheese and margarine displacement estimates are updated. Additionally, a discussion of the current status of TEFAP, including the purchase of commodities through the Hunger Prevention Act of 1988, and the displacement issue is provided.

## REVIEW OF PREVIOUS ESTIMATES

Previous analyses indicated a negative effect on commercial cheese and butter sales due to TEFAP donations. The magnitude of the effect, however, depends on the amount and frequency of the donations relative to recipients' typical consumption. Using various estimation methods, USDA concluded that displacement of commercial cheese sales was substantial, although results were consistently less than 50 percent of prior TEFAP household purchases. Estimates have ranged from 27 to 48 percent over the past three years. A mid-range estimate of 35 percent was derived using data obtained from a recipient household survey conducted in October 1986. Because this estimate was based on pre- and post-program cheese purchase data, USDA determined in the 1987 and 1988 reports that it provided the most secure empirical finding of the models available then. USDA also concluded that 35 percent was the best estimate to use in any subsequent analysis of the program. However, since this estimate was based on a one-time data collection effort, a revision is not included in this report.

USDA also previously estimated cheese displacement by comparing cheese consumption prior to TEFAP distributions to current donations per capita. The estimated displacement rate from this method was 27 percent in both 1987 and 1988. Pre-program cheese consumption data were obtained from the 1980 Supplemental Low-Income Sample of USDA's Nationwide Food Consumption Survey. A major weakness in the estimation method based on the 1980 data is that it assumed no changes in cheese consumption since before the program began. In this regard, the model based on national commercial disappearance data, discussed below, is superior. The increasing strength of the domestic commercial cheese market may indicate that changes in cheese consumption have occurred. Since more current low-income household cheese consumption data are not available, the estimate based on this comparison will not be revised this year.

Econometric models using national commercial disappearance data are the only reliable method available to estimate displacement







of commercial margarine sales due to butter or cheese donations. In the 1986 report to Congress, USDA estimated that, for TEFAP households, each pound of donated butter reduced commercial sales of margarine by about 80 percent. In the two later reports, butter donations were found to displace almost 100 percent of commercial margarine sales among TEFAP households. Commercial cheese displacement estimates from this model ranged from 45 to 48 percent of TEFAP household purchases.

#### NATIONAL COMMERCIAL DISAPPEARANCE DATA MODEL

The approach using national commercial disappearance data to estimate displacement of commercial margarine and cheese sales is the only method revised this year. These data, which are based on calendar year and are available from 1955, are constructed by adjusting national production data for exports, imports, and Government purchases. A seventh observation (1988) of the donation effect was added to the time series to update the estimates. The model controls for program donations per capita from 1982-1988 and for other factors affecting commercial purchases. The model and its coefficients are shown in the Appendix.

#### Margarine Displacement

The updated model indicates that USDA butter donations significantly affect commercial margarine sales among TEFAP households. Essentially, each pound of butter donated reduces margarine sales by one pound. Monthly TEFAP butter donation levels have not changed since August 1985, and, as anticipated, the displacement estimate for this year is consistent with past years.

#### Cheese Displacement

The disappearance model indicates an average displacement rate of 23 percent for the period 1955-1988. Distributions of process cheese through TEFAP ceased in April 1988. Because the model is based on annual donations, however, it is not able to estimate a change in the displacement rate due to the suspension of cheese donations. In addition, the model is based on USDA shipments to States. Because some States accumulated significant inventories of cheese, they were able to continue distributions after Federal donations ceased. This further complicates the estimation of the impact of changing donation levels.

The change in donations does not affect the validity of the estimated coefficients, which showed little change. The decrease in the displacement estimate from previous years to this year may be due to large standard errors instead of an actual decline in the rate. More observations are required to form a conclusion.





The evidence suggests, however, that program impacts on commercial markets are not different from last year.

## PROGRAM STATUS

Inventories of surplus process cheese and nonfat dry milk available for the program were depleted last year, with distributions of process cheese ending in April 1988. The concern of Congress for the decreased levels and types of commodities available for household distribution was reflected in the Hunger Prevention Act of 1988 (P.L. 100-435), which required the purchase of \$120 million worth of commodities for donation through TEFAP in Fiscal Years 1989 and 1990. The commodities purchased were peanut butter, dried egg mix, canned beans, canned pork, and raisins.

The procurement of these commodities from the commercial market changes the program's focus. TEFAP was originally intended to dispose of surplus commodities acquired under price support programs as well as provide food assistance to needy individuals. The emphasis of the program has shifted toward primarily providing supplemental food assistance to low-income households.

The types of data used to estimate displacement effects due to the distribution through TEFAP of cheese and butter are not available for the products purchased from the commercial market. To make such an estimate, at a minimum, information would be needed on total domestic market size for each commodity and low-income population purchase or consumption patterns for each item. Further, several observations would be needed to form conclusions.

However, for descriptive purposes, information is available on TEFAP commodity donations as a percent of their markets. This information is provided in an appendix table. An important point to note is that total market data are not available for all products. Information for all products distributed is only available for sales through retail food stores. While simple statistics are derived from the retail market data, they are not the most appropriate for comparisons.

Although USDA does not have sufficient data to estimate displacement of sales of the five purchased commodities, probable market effects can be hypothesized. For TEFAP recipients, the donations of products substitute for usual purchases of those or related items. It is reasoned that the larger the number of available substitutes for each product donated, the smaller the effect on any particular product. Thus, it is likely there is no net displacement effect for any of the five products. TEFAP donations either substitute for like products or increase demand to the degree that recipients would not have ordinarily purchased the products.





## SUMMARY

Unless current dairy market conditions change dramatically, surplus inventories of cheese and nonfat dry milk will no longer be available to TEFAP. The displacement of commercial cheese sales due to TEFAP donations should not, therefore, continue to be a concern as a potential program impact.

A pound-for-pound displacement rate for commercial margarine sales due to butter donations is indicated by the econometric model based on national commercial disappearance data. This finding, which is consistent with that reported in previous years, is expected as monthly donation levels have not changed since mid-1985.

USDA does not have sufficient data to estimate displacement effects due to the distribution through TEFAP of commodities purchased under the Hunger Prevention Act. However, it is likely that there is no displacement. It could be hypothesized that the donations of commodities substitute for usual recipient purchases of those or related products, or increase demand to the degree that recipients would not have ordinarily purchased the products.





## APPENDIX

The national commercial disappearance data model is specified as follows:

$$Q_t = b_0 + b_1 P_t + b_2 POM_t + b_3 RY_t + b_4 TEFAP + B_5 DO_t + e_t$$

where,

- t is the time period
- Q is per capita commercial disappearance in pounds
- P is the real price of American cheese (or butter)
- POM is the real price of the product "other meats"  
(or margarine) (substitutes for cheese or butter)
- RY is real per capita income in thousands of dollars
- TEFAP is per capita donations of cheese (or butter)
- DO is per capita other Government donations of cheese  
(or butter)
- e is a random error term





## ESTIMATED COEFFICIENTS OF ANNUAL COMMERCIAL DISAPPEARANCE

Table 1. Cheese

<u>Variable</u>	<u>1955-1988</u>	<u>Estimated Standard Error</u>
Intercept	-2.38	(2.16)
Real price of American cheese	3.97	(1.43)
Real price of "other meats" a substitute for cheese	-0.37	(1.06)
Real per capita disposable income in thousands of dollars	2.14	(0.50)
TEFAP donations per capita	-0.23	(0.17)
Other Government donations	-0.22	(0.17)
Mean squared error	0.081	

Table 2. Margarine

<u>Variable</u>	<u>1955-1988</u>	<u>Estimated Standard Error</u>
Constant	7.68	(3.46)
Price of butter	1.52	(2.00)
Price of margarine	-1.09	(0.72)
Real per capita disposable income in thousands of dollars	0.76	(0.75)
TEFAP donations per capita of butter	-1.38	(0.45)
Other Government donations	-0.74	(0.29)
Mean squared error	0.088	



# TEFAP DONATION LEVELS COMPARED TO TOTAL AND RETAIL MARKETS

Commodity	TEFAP	Estimated Total Market	Percent of Total Market	Estimated Retail Market	Percent of Retail Market
Process Cheese	176	2558	6.9	879	26.6
Margarine (butter)	67	2526	2.6	2017	3.3
Butter	67	910	7.3	506	13.2
Canned Beans	28	N/A	N/A	1268	2.1
Peanut Butter	42	N/A	N/A	607	6.9
Canned Pork	41	N/A	N/A	338	12.1
Raisins	9	N/A	N/A	169	5

## NOTES:

Calendar year 1988 data

All volumes are in millions of pounds.

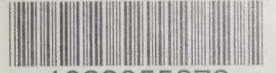
Estimated retail volume for all items except pork is 1988 data obtained from the "Annual Trend Report 1984-1988, Total Projected Physical and Dollar Volumes", Food Department, A.C. Nielsen Co. Canned pork data were adapted from "Meat Products Canned Under Federal Inspection, 1987, FSIS, USDA.

An estimate for the retail volume for egg mix is not available. The projected TEFAP purchase is 9.1 million pounds.





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